

ACHOMAWI GEOGRAPHY

BY

FRED B. KNIFFEN

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EDITORS' PREFACE

Mr. Kniffen's fieldwork here reported on was planned in the spring and carried out in the summer of 1926. In December of the same year appeared Dr. C. Hart Merriam's "Classification and Distribution of the Pit River Indian Tribes of California,"¹ based on studies prosecuted since 1907, and to be followed, it is hoped, by publication of similar studies on other native groups for which he has long been collecting intensive data.

Though Dr. Merriam's and Mr. Kniffen's papers each deal with certain matters not treated in the other, they partly cover the same ground and thus provide a reciprocal check such as is too often lacking in field studies. The maps show at once the essential agreement. This agreement is even greater than superficially appears, since the Indian, though he recognized boundaries, lived and thought primarily in terms of habitat and land utilization, only secondarily of delimitation. Both authors recognize the same eleven groups, in very nearly the same areas, and under identical names: where these differ, it is through diverse but consistently followed orthography. The one group differently named is Merriam's Tomallinchemoi, corresponding to Kniffen's Itsatawi, who constitute only a subgroup according to Merriam. It is in the region of the same people that the principal discrepancy as to group areas occurs. Kniffen restricts the Itsatawi to Goose valley, south of the Pit, whereas Merriam carries the territory of the larger Tomallinchemoi group north across the Pit in a wedge between the Modesse and Ilmahwe.

As to territory diversely attributed to the Achomawi and to other Indians, the one tract of consequence from the point of view of aboriginal occupation was the extreme west, where Merriam cites the Epooche on Montgomery creek and the Ahmeche at the Cove as being either bands of the Modesse or distinct Achomawi groups; whereas Kniffen allots their frontage on the Pit to the Yana and Wintun.

¹ Smithsonian Miscellaneous Collections, 78:1-52, pls. 1-27, map, 1926.

Curtin,² Sapir,³ and Waterman⁴ make Montgomery creek Yana, not Achomawi. On the other hand, Merriam has had the advantage of approaching this part of the problem from the Yana and Wintun side as well as the Achomawi.

The largest area in disagreement is in the northwest, where Kniffen extends Achomawi claims across the upper McCloud to Mt. Shasta, whereas Merriam attributes the tract to the Okwanuchu. Since the area was uninhabited forest, little more than hunting rights seems involved. In the southeast, Kniffen does and Merriam does not give Horse lake to the Aporige; but again the former claims no settlements.

The lists of settlements and sites agree closely so far as they correspond, but each series includes many names not contained in the other. Such supplementing is an advantage resulting from independent work over the same ground. Whoever has attempted ethnogeographic recording is aware that complete data can never be secured from any informant, nor wholly consistent detail from a number of them, especially where most of the natives no longer live on the old habitation sites.

Kniffen's characterizations of the physiography, fauna, and flora of each of the eleven ethnic areas find a welcome counterpart in Merriam's occurrence lists for the Madesi and Atwamsini areas as representative of the western and eastern divisions of Achomawi territory. From these lists it appears that the west possessed the fisher and martin, the gray, pine, and flying squirrels, the mountain quail and red-headed woodpecker; the east, the bison, antelope, badger, ground hog, kangaroo rat, sage-hen, and Rocky Mountain magpie. Animals such as jackrabbits, rabbits, chipmunks, ground squirrels, wood rats, skunks, owls, and jays are common to both divisions, but in different species. The flora, too, is essentially north Californian in the west and of Great Basin type in the east. The cultural cleavages that Kniffen has established appear to coincide closely with the faunal and floral line across Achomawi territory. Nevertheless, both authors seem to recognize a considerable ethnic and cultural unity for all the Pit River Indians.

It may be added that a recent climatological study made on a new basis,⁵ puts the whole of Achomawi and Atsugewi territory, with the

² *Creation Myths of Primitive America*, 531, 1898 (1911).

³ This series, 9: 2, 1910.

⁴ This series, 13: 35, map 1, 1918.

⁵ R. J. Russell, *Climates of California*, Univ. Calif. Publ. Geog., 2: 73-84, 1926.

exception of that of the western marginal Madesi, into a Microthermal Humid climate; and that this climatic zone comprises no other areas of California inhabited in pre-Caucasian days, except those of the adjacent Northeastern Maidu and the Modoc. The underlying cultural uniformity of the Achomawi and Atsugewi appears therefore to be environmentally conditioned; and certain traits noted for the Northeastern Maidu, which mark them off from all the other Maidu, and of the Modoc and the Klamath,⁶ would seem similarly grounded.

INTRODUCTION

The object of this paper is the reconstruction of the picture presented by the Pit River Indians of California—the Achomawi and Atsugewi—and of their habitat and occupied sites before the coming of the whites. It is based on fieldwork done in the summer of 1926.

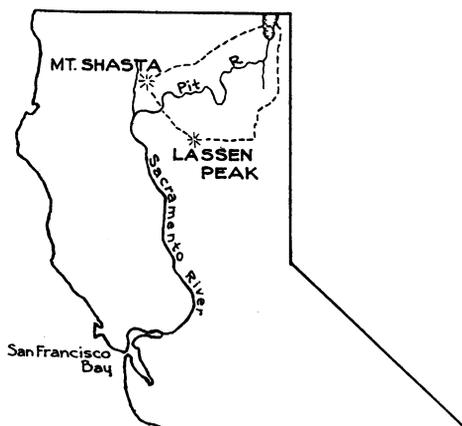
Certain difficulties make a complete reconstruction impossible. In large areas the native vegetation has been succeeded by that introduced by cattlemen and grain ranchers. To a smaller extent the cutting of timber has altered the landscape. Then the Indians themselves, at times, tell conflicting stories about the political makeup of the area. They have forgotten about certain villages whose former existence is established by the remains of dwellings and heaps of obsidian chips. The attempt at a numerical reconstruction is admittedly an estimate, but an estimate based on determination of the distribution of winter houses and the number of persons in each. In spite of these drawbacks the writer believes that he has the essential details necessary to the presentation of the former scene in its broad outlines.

No special section will be devoted to a picture of the whole culture of the Pit River people. On the other hand, no systematic picture of the natural conditions will be given, but bits of this will be introduced as they are needed to complete the ensemble which constituted the culture area. Finally, two maps may serve to lend unity to the whole and will present in graphic form some of the facts and details difficult to delineate clearly in the text.

⁶ A. L. Kroeber, *Handbook of the Indians of California*, Bur. Am. Ethn., Bull. 78: 335, 441, 1925.

COUNTRY AND FOOD

The Achomawi and Atsugewi, or Pit River Indians of northeastern California, claimed as their own a vast territory. It extended from Mount Shasta and Goose lake on the north to the Madeline Plains and Mount Lassen on the south; from the Warner range on the east, to Montgomery creek on the west. It must not be thought, however, that the habitations and villages of the Pit River people were distributed over this whole region. Great differentiations, climatic,



floral, faunal, hydrographic, and orographic, made much of this area most inhospitable to permanent occupation. It was along the Pit river, in the vicinity of Goose and Eagle lakes, in great fault valleys, in tule marshes, that the centers of attraction were found. Here the raw materials necessary in the objective expression of a primitive culture were found most available and most abundant.

To the north of the Pit lies the high, dry lava country. It contains a few springs, and there is an abundance of timber ranging from the yellow pine and fir of the west to the sparser juniper of the east. There are meadow-like depressions where deer and antelope were numerous, but the Pit Rivers were not great hunters. There are lacking those marshy tule areas whose roots and grasses furnished a large part of the livelihood of the people. Then there is a dearth of the smaller animals always acceptable as food, and of course fish are lacking. The elevation of the lava mesa is sufficient to favor the heavy

accumulation of winter snows. This is a factor which made the valley much to be preferred as a site for the building of the winter house. For this reason the upper McCloud river never knew a permanent village but was visited only occasionally in summer by hunters in pursuit of elk. It is likely that the whole of the country north of the Pit was visited but infrequently, only Glass mountain being approached regularly. This latter place served as a source of obsidian arrowhead material for all the western Pit Rivers. This fact probably determined in large part the boundary to the north, for otherwise there would have been no point in claiming territory so far beyond the limits of utilization.

The country about Lassen Peak is high, heavily timbered, and contains an abundance of lakes. This region was visited in summer for hunting, berrying, and gathering. The cold and deep snows of winter forced a descent into the lower valleys.

To the southeast lies the great, treeless, dry bolson, the Madeline Plains. This was a sort of no-man's land, only the moister margin being visited in summer for the gathering of roots.

To the east lies the Warner range, certainly not a great barrier, but a climatic and cultural line and a convenient boundary. It is an area of little importance from the viewpoint of subsistence and was probably not regularly visited.

West of Montgomery creek the country becomes much rougher. There is a heavy forest cover of pine, oak, fir, cedar, and some rarer trees such as the buckeye, maple, alder, ash, yew, manzanita, and madrone. Extensive swampy areas are rare. This country was occupied by a people of a somewhat different culture, the Yana, with whom the Pit Rivers were generally on bad terms.

The valley areas, in addition to their greater protection from winter snow and cold, offered an amazing variety of food both animal and vegetable. The tule itself, in addition to its uses as material for the making of mats, shoes, twine, etc., is edible. Particularly in early summer are the tender shoots readily palatable, either cooked or raw. In addition are found in the marshy areas camass roots, a number of species of lilies, Indian potatoes, and seed-bearing grasses. Most of these could be immediately consumed or stored for winter usage. In the protected valleys are a number of fruit-bearing trees not found on the mesa. Among these might be mentioned the yew, manzanita, wild plum, and Oregon grape. Then in the less swampy areas or in the uplands adjacent to the valleys are found the epos

root, wild garlic, wild turnip, wild buckwheat, all highly regarded as food. The westerly section of the area knows the oak with the acorns and all the accompanying technique of acorn soup and bread. As far east as Fall river the salmon was an important part of the food economy of the Pit Rivers. East of Fall river, suckers, pike, and trout were found and taken in abundance. In spring the northward moving waterfowl stopped at the little lakes and swampy areas. At this time of year ducks, geese, brant, and cranes were plentifully present. Sage hens and quail were shot, snared, and netted. All the smaller animals, badger, ground hog, squirrel, rabbit, mink, and martin, were considered edible. Even the insects were relished, grasshoppers, salmon flies, and maggots of yellowjackets, bald hornets, and ants. All these were in addition to the bigger game which naturally gravitated toward the water and the lush feed of the valleys: deer, antelope, occasionally elk, possibly a few bison, and bear. The methods of taking and preparing all this food are almost infinite in number and exhibit a fairly high degree of specialization. In spite of this seeming abundance starvation was not at all unknown. Early frosts might cut off the acorn crop, the salmon run might fail, or any number of other things serve to lessen the supply of food.

The term "centers of attraction" is used advisedly. The areas of principal settlement were not at all continuous, even along the Pit. In its westward course the river cuts its way by steep-walled canyons from one great fault valley to another. The most prominent scarps of these latter have a north and south direction. The canyons were regions of little possible utilization and hence served as natural dividing lines between the various groups. It must be remembered that these people had no horses and the nature of the Pit forbids the extensive use of boats. The rough country, the canyons which separated the favorable sites, are not conducive to rapid and easy intercommunication among foot travelers. The other favorable sites lay along the few tributaries of the Pit or in isolated sections in the vicinity of Eagle and Goose lakes.

PEOPLE

The Indians recognized eleven groups, each composed of those dwelling on a single site or on several nearby sites. Occupying a broad extent of country under a wide range of conditions, these groups were not equally endowed with opportunities for getting food. The oak is found extensively only in the western part of the area. There was a limited trading of acorns eastward. Salmon ran only as far east as Fall river. Yew wood for bows is found only in the extreme western part of the area. Two places on the extreme northern boundary of the territory served as the source of all the arrowhead material, Glass mountain and Sugar hill. Deer were particularly abundant on the lower slopes of the Warner range. Certain sites were favorable for the gathering of the epos root, others for wild plums. Where communication was fairly easy there was an exchange of gathering, hunting, or fishing privileges between the different groups if these groups happened to be on friendly terms.

Nine of the eleven groups are collectively termed Achomawi in anthropological literature. They had no tribal word for themselves, but spoke of themselves as the *is* or "people." Achoma or Adzuma means in their language "river," and generally designated the Pit. Almost the only common bond of the Achomawi was their speech, and tradition has it that it was originally spoken by one group only and gradually spread to the others. There are considerable dialectic differences in the language, but it is always mutually intelligible. There was no suggestion of a unified political organization; certain groups were even traditional enemies.

The two remaining groups are generally termed Atsugewi. They occupied the southwestern portion of the territory: the valley of Hat creek, Dixie valley, and the region about Eagle lake. According to their own statements their language is not intelligible to the Achomawi, but they themselves understand the language of the Achomawi. The two Atsugewi groups, properly the Atsuge and Aporige, were on friendly terms, though the boundaries between them were strictly respected. With some of the Achomawi they were very friendly, with others they were habitual enemies.

THE ACHOMAWI

Here we shall pass to a discussion of the eleven groups. By this method we can establish for each a relationship to the land which it occupied. Also, each group was quite sovereign and maintained various relations with the others.

HAMMAWI

Hamma'wi was the name applied by the other groups to those Indians whose territory centered about the South fork of the Pit. As is generally true of the California Indians, the name applied primarily to the country rather than to the people; the ending *-wi* designates that persons are referred to.

The main settlement of the Hammawi was about the swampy valley of the Pit near the present village of Likely. Here the end of the valley is encompassed to the south by a bold circle of hills. This area was very fittingly termed Tulu'kupi, "end of the sack." Two semi-independent areas were in Jess and West valleys, or Bu'ya and Batsu'lomit respectively. These latter are flat-bottomed, swampy fault valleys lying immediately at the base of the Warner range. Their drainage is to the Pit through steep-walled, narrow canyons carved in the lava mesa. A fourth site which should probably be classed as Hammawi is some distance from the others, near the mouth of Canyon creek which enters the main Pit near the old site of Center-ville a short distance above the town of Canby. This was termed Lusate'mi.

The land of the Hammawi is a semi-arid one of cold winters and moderately warm summers. The ever abundant streams of cold water which run down from the mountains of the Warner range demonstrate their exotic character by the sharply incised channels which they have cut. Away from these streams water is lacking.

A great distinction in the nature and amount of the vegetation follows location with reference to the life-giving water of the streams. The swampy areas, with a growth of tule and willows, were formerly impassable. In the canyons with abundant water and protection from the hot sun are found the yellow pine, willow, cottonwood, and a variety of smaller flora. On the margins of the swampy areas of

Jess and West valleys and on up into the mountains is a continuous cover of conifers. Above the valley areas, on the rocky mesa, vegetation is rather sparse. Sagebrush is the ground cover out of which protrudes a scattering growth of junipers.

Each season had for the Hammawi its special task. Certain foods were available and gathered at certain periods. Seasons of little fruitfulness were spent in the making and repairing of implements. From April to June the gathering of roots was the important task. This was done by women. On their backs they carried the conical root basket. The roots were dug out with the pointed digging sticks and tossed over the shoulder into the basket. From the drying depressions on the mesa above Tulukupi, from the borders of Madeline Plains, came the paha or epos. This was dried and stored for winter. From the swamps came the "tule potato," knocked from the bottom with long sticks when the ice still remained; also the camass root and a variety of tulips, not to mention the tule itself. Then from the higher lands came the berries: salmon berries, bear berries, juniper berries; with the wild plum and wild buckwheat. All these could be dried, ground, and stored away for the winter.

Hunting and fishing were in the hands of the men. The streams abounded in pike, suckers, and trout. In the spring and summer fish were speared with the forked spear. In winter nets were set through the ice and the fish driven into them. The fish were eaten fresh, or dried, pulverized, and stored for winter use.

The foothills of the Warner range offer excellent grazing for deer and there they were taken in great numbers in drives conducted in the fall of the year. The Hammawi invited their relatives from down the Pit to come and take part in the drives. The relatives came, hunted, and carried the meat back to their homes. In exchange they left yew bows, round disk shell beads obtained from people "far toward the west," some dried salmon, a little acorn meal, or perhaps a few obsidian pebbles. They took home with them some of the otter skins which were so abundant in the Hammawi country.

In the winter the people of the Hammawi group gathered together in the astsue or winter houses. These they constructed by digging out the ground some four or five feet. In the center a post was set; to the top of this, poles were leaned from the edge of the excavation. The poles were covered first with bark and then with dirt, space between two poles being left for an entrance and smoke hole through the roof. Another hole through the bottom was for the women and

children. An open fire provided heat during the long winter. Hunting went on to some extent. Occasionally deer could be run down on snowshoes. Then there were weapons, clothing, and utensils to make and repair. Arrowheads were chipped out of the obsidian pebbles obtained from Sugar hill on long summer trips. Arrowshafts of willow and rosewood were carefully straightened and dressed with pumice. A crude shirt was made out of hides of deer. Moccasins were made from deerskin and even from tule and sagebrush. A legging was made of deerskin. Skins of skunk and other small animals were cased, a slit cut in them, and they were used as caps.

Each of the groups of the Hammawi had its own chieftain. In fact the people of Buya and Tulukupi were often on bad terms, generally over the matter of women. But they were united by the aggression of the Northern Paiutes, who were their traditional enemies and frequently crossed the Warners because they "liked to fight." The Hammawi were free from the raids of the Modoc-Klamaths, but were frequently retained by the Pit Rivers of Hot Springs and Fall river to aid them in their battles against the invaders. The reward of the Hammawi was generally in women. This worked out conveniently, as they did not marry relatives and were forced to go outside their own group for wives. With the Maidu or Pagma'li they seem to have had little contact. The Dixie Valley people or Amit'si were friends of the Paiute, therefore enemies to the Hammawi. The ties of blood were potent ones, so that intermarriage with groups of the lower Pit brought about visiting, interchange of hunting and gathering privileges, and fairly extensive trade.

An estimate of the numbers of the Hammawi before the coming of the whites will give that group about 250. This is admittedly a rough guess, as so many of the former sites of winter houses have been effaced. It is based primarily on estimates of the Indians themselves.

KOSALEKTAWI

The Kosale'ktawi were centered about the valley where the north and south forks of the Pit join. A constriction in the valley near the mouth of Fitzhugh creek bounded their territory to the south. They followed the north fork to Bob's creek. The mesa which rises abruptly to the north of the Pit belonged to another group.

The natural vegetation was about the same as for the Hammawi. In the swamps were found the tule and willow, in the drier margins a great variety of edible roots. Above the valley the sagebrush-

juniper association is prevalent, in fact the term Kosalekta means "sidehill where the junipers grow," and applied particularly to the site of the present town of Alturas. The term is merely a convenient one for designating these people. They had no particular name for themselves, though they had a headman whom they recognized; and they were united with the other Pit Rivers only as it was convenient.

The matter of place names brings up a striking cultural trait which they shared more or less with other California Indians. No feature of the landscape of noticeable size seems to have been without a name. Frequently these show a keen appreciation of some natural phenomenon such as shape, or the nature of the vegetation. Sometimes the place might have a connection with an event of mythology. Not only were the spots named, but the nomenclature was so well known that places could be located with perfect accuracy by speakers many miles away. This knowledge of the country was utilized in hunting, warfare, and travel.

Climatic conditions in the land of the Kosalektawi are similar to those in the territory of the Hammawi. The summers are warm and dry, though cool days and thunderstorms are known. The wind blows often and it blows hard and mournfully. Dust whirls are frequent and they enter into the mythology of the people. In winter the snows are deep and zero weather is frequent.

Fishing was particularly good on the Pit near the forks, and by long established custom the Kosalektawi shared this with the other Pit Rivers down to Big valley. The hunting was their own, however, and the rights were jealously guarded. Deer pits and certain ground hog holes were privately owned; otter slides and eagle nests were handed down from father to son or to other relatives.

Among the other Pit Rivers the Kosalektawi seem to have played the part of a rather isolated, small, inoffensive group. This, however, did not serve to protect them from the raids of the Lutuami though they do not seem to have been subject to these raids so frequently as their neighbors to the north and west. They were also open to the attacks of the Paiute, though the Hammawi seem to have been more often attacked.

Perhaps more than any other group the Kosalektawi have decreased in numbers, until now they number only a paltry handful. Their former village sites have been smoothed over until they are rarely discernible. For these reasons an accurate estimate of their former numbers is impossible. One might hazard a guess of 125 and be within a reasonable distance of accuracy.

HEWISEDAWI

Hewise'dawi is the name by which may be designated the people who occupied the little fault depressions in the mesa to the north of the Pit, and the territory about the North fork and Goose lake. The name is fit for it means "on top," which of course refers to the top of the mesa as opposed to the valley.

The favored sites of this group were rather isolated from one another as well as from the remainder of the Pit people. They included Hatsana'i on the present site of Big Sage reservoir, as well as sites about Goose lake. In spite of this fact some feeling of unity seems to have existed among these people, unity of opposition against the Lutuami, if no other.

The boundary of the Pit Rivers' territory in the region of Goose lake is difficult to determine. According to information gained from certain Achomawi and the Modoc, it extended northward to an east and west line crossing the lake in the vicinity of Lawson creek. Others of the Hewisedawi claim that they occasionally hunted north to the present sites of Lakeview and Bonanza in Oregon. As one said, "After the Lutuami had destroyed our dwellings and carried off our women and children, we made a great hunt lasting several weeks. We passed clear around Goose lake, killed much meat, feasted, and danced. When we arrived home we had forgotten our sorrows and were happy again." In spite of possible excursions of this nature, the farthest north village of the Achomawi was located on Lawson creek. This was called Ali'sede.

Excepting that the country is higher and drier and that the swampy areas are fewer and less extensive, the resources of the region in edible plants are similar to those already discussed. Only the region of Goose lake offers something different. This lake possesses the peculiarities of lakes in semi-arid lands. Dependent as it is on the winter snows of the Warner range, its volume reflects strikingly the variation of precipitation which occurs in irregular cycles. At present the lake bed is nearly dry. In 1875 it flowed into the Pit. In 1849 wagon trains passed over its dry bed. According to one Indian tradition it has been dry five times. On the present dry bed are found heaps of obsidian chips which indicate at least some kind of dwellings. Above the highest discernible strand line are found the sites of villages with the astsue holes still plain. An abundance of fish was the major contribution of Goose lake to the food supply.

Just how these were taken, and whether canoes were used, is not known. It is an impression that these people were not extensive users of canoes, as their accounts speak mostly of walking about the lake. In addition to the fish as a food contribution must be mentioned the geese and other waterfowl which formerly occurred in countless thousands on the waters of the lake.

The slopes of the Warners offered excellent deer hunting; obsidian for arrow heads was directly at hand; the region is well known for its abundance of wild plums; other gathering is favorable; and on the whole it was a hospitable area, though at present not an Achomawi dwells on the shores of Goose lake. Superstition may have something to do with this. Sugar hill is *dinehowit*, or sacred, and the Indians fear to offend its spirit.

Though direct information is lacking, it is probable that this group possessed no central organization but consisted of a group of settlements each with its headman. Their common bond was a fear of the raids of the Lutuami or the Modoc. To these raids they seem to have offered a curious lack of resistance. The raids were accepted as a dispensation of nature to be endured. It was not to the interest of the Modoc to exterminate the Hewisedawi but rather to preserve them as a source of supply of slaves who might be traded for other goods.

An estimate of the Hewisedawi numbers gives a total for the group of about 175.

ASTARIWAWI

The name *Astari'wa* refers specifically to the hot springs about four miles east of Canby and means "hot spring." The name is used for the whole group occupying the area along the Pit from the narrowing of the valley about eight miles west of Alturas to the crest of the mountain east of Big valley. The major former Indian sites are four: *Dalmo'ma*, at the hot spring about eight miles west of Alturas; *Astari'wa*; *Tapaslu'*, where the highway crosses the Pit below Canby; and *Ha'ntyū*, or Stonecoal valley. These four groups are somewhat separated from one another, but the area as a whole is distinctly set off from the neighboring groups.

The country of the *Astari'wawi* is then a rather loose collection of separated sites, somewhat similar to that of the Hewisedawi. There is no great expanse of swamp and meadow as in the case of the *Kosalektawi*, therefore fishing becomes more important; *Tapaslu* was

long the site of an important weir. The mesa to the north is said to have abounded in mule deer, antelope, and small game. The gathering was very much the same as in the regions already discussed. Some gathering and hunting sites belonging to other groups were shared by the Astariwawi. The people of Astariwa annually repaired to Hatsanai for root-gathering. The Hantyu group held duck-hunting rights in Big valley. Both Glass mountain and Sugar hill were visited for obsidian.

Each of the four subgroups seems to have preserved an independent existence, though within the last fifty years there has been a central chief dwelling at Astariwa, whose office has been handed down in the paternal line.

The Astariwawi were subjected to raids from the north, though they say that these came from the "Oregon Indians, not the Modocs." With their other neighbors they seem to have been on generally friendly terms. They fought with the Atsuge over hunting rights and doctor-killings when these matters could not be settled amicably in council. They shared hunting rights with the neighboring Achomawi groups, and sometimes aided or were aided by them in the fights against the invaders from the north.

Two hundred should be a fair estimate of their former numbers.

ATWAMSINI

The name Atwa'msini means "valley dwellers" and properly applies to a small group in Big valley occupying the swampy margin of the Pit about three miles north of the present town of Bieber. The name is fittingly used to apply to the twenty odd groups occupying Big valley. Included is the outlying Ash Creek valley, separated from the main valley by a canyon some six miles in length.

Big valley is an extensive flat-bottomed depression of tectonic origin. To the east and west it is steep-walled. It rises less abruptly to the north until it is lost in the great lava mesa. The high hills to the east, west, and south are pine covered; the lava mesa to the north preserves its customary covering of sage and juniper. About the water courses of the valley are tule, cottonwood, and willow. In the dryer areas the sunflower and sage are prominent.

The main course of the Pit passes from north to south through the center of the valley; tributaries are rather scarce. On the whole the drainage pattern cannot be said to be intricate; this was of significance in the determination of settlement sites.

The swampy area in the center of the valley, formerly greater in extent, played a major rôle in the economy of the people. Tule with its thousand uses was found in abundance; people came from Fall river and Stonecoal to share in the excellent spring duck-hunting; seed-bearing grasses and edible roots were plentiful.

The mesa to the north offered excellent deer-hunting, and communal "ring-fire" hunts were conducted. Mount Shasta was approached in elk-hunting. Glass mountain served as the source of obsidian, as it did for all the groups farther west.

Private ownership of eagles' nests, otter slides, and deer pits was recognized.

As stated, the valley was divided among some twenty small groups, each of which was mostly composed of relatives. A headman was recognized for each. Generally some particularly able headman exerted a strong influence over the whole valley; in at least one case this was a woman. Among the more important of the group sites were A'twam, already mentioned; Asi'tiwa or Round valley; Dabo'ke, or Ash Creek valley; Chahi'dje, about four miles northwest of Adin; and Sustade'dje, at the hot spring five miles east of Bieber.

The Atwamsini were generally on good terms with their neighbors. Even with the Amitsi, their Atsugewi neighbors, they seem to have fought but rarely, and frequently exchanged privileges. While they were subject to the raids of the Lutuami, they seem to have been better off in this respect than their neighbors to the east or west.

According to their own estimates the former numbers of the Atwamsini were around three hundred. In view of the rather favorable economic conditions this would appear to be no exaggeration.

ACHOMAWI

Acho'ma'wi, the name current for one of the major groups and in fact for the whole aggregate of the Pit Rivers, is properly applicable only to the inhabitants of a site on Fall river north of the present town of Fall River Mills. The term means "dwellers by the river," and was used locally as the designation of this small group.

Fall River valley is a natural area. To the east is the abrupt wall of Big mountain. To the west is a row of old volcanoes, of which Fort mountain is one. The rise to the north is rather gentle, and one gets the impression of a steep-walled chute with the lower, flatter portion bordering the Pit on the south.

The change in vegetation from the areas previously considered is considerable and significant. With Fall river come the oak and acorn. Alder, hazel, sweet clover, the sunflower, and the cottonwood are found greatly increased, while the sage-juniper association is less prominent. The swampy areas about Fall river and Tule lake are thick with tule. Roots and grasses are abundant.

Fall river also marked the upper limit of the salmon run. In addition there were trout, suckers, and pike. Along the Pit, mussels can be found. At the northern end of the valley deer were numerous. The whole region abounds in smaller game, rabbits, squirrels, porcupines, quail, and pigeons.

Dugout canoes were used extensively in this area, the only Pit River area of which this was true. They were well made, of pine logs, and were used for transport, fishing, and tule gathering.

The nuclear site was about the swampy area in the middle of the valley. Here, about Tule lake, were grouped a number of settlements, and they extended scatteringly along the course of Fall river down to the Pit.

For each of these smaller groups there was a recognized headman, but until recent times there was no general chief for the whole group. The recognition of property rights was limited to the sites occupied by the winter houses, though this was firmly established.

With their immediate neighbors the Fall River people were on good terms. With the Lutuami however they seem to have been continually at odds, though it would be better to say that they were subject to continual raids. They appear to have been quite defenseless against their northern foes.

A conservative estimate would place their former number at 350.

ILMAWI

From the canyon of the Pit below Fall river, to the divide between Clark and Rock creeks, and including Cayton valley to the north, was the area occupied by the Ilma'wi. With the exception of Cayton valley there are no great swampy or marsh areas. The banks of the river rise rather abruptly by a series of terraces, so that the major sites are along the river. The hillsides are fairly heavily forested, oaks being prominent in the association.

Excellent sites and abundant salmon, trout, pike, and suckers made fishing prominent in the economic life. Acorns were abundant,

as were berries and seeds, while game, small and large, could be found close at hand. Canoes were used in fishing and ferrying.

Large villages were found the length of the area along the river, and the whole of the river front was divided into sections. Each of these was said to "belong" to a certain man. On this lived his relatives. He announced when it was time to gather or hunt. He was the headman whose word was authority. It was a sort of patriarchate, the title to the site being passed down from father to son. Prominent among these sites were Katsade', immediately below the mouth of the canyon leading from Fall River valley; Seku'iyuwadi, at the mouth of Hat creek; Tuwa'temi, at the mouth of Burney creek; and Sutite'okgeloi, in Cayton valley. There appears to have been no main chief over the whole area.

While the Ilmawi were not subject to the raids of the Lutuwami, they were generally on bad terms with the Hadi'twiwi or Hat Creeks, who were their neighbors on the south, separated by a few miles of undesirable, forested mesa.

The Ilmawi probably numbered at least 350 in former times.

ITSATAWI

The Itsa'tawi or Swasti'djanadji were a small group occupying Goose valley and lower Burney valley. In addition, a stretch of several miles on the Pit, northwest of Goose valley, was regularly visited and utilized as a summer fishing ground. It is in this area that the Indian economy connected with swampy tracts reached its maximum development. Tule and all the roots and grasses were found in abundance. Stretches of open water made spring waterfowl-hunting of importance. The surrounding hills furnished a supply of berries, of sugarpine nuts, and of all kinds of game.

In the winter, a series of privately owned sites about the sides of the valley and along the Burney were occupied by family groups. In the summer all moved down to the Pit for salmon fishing. As might be expected, there was no head chief for the whole group, an old man being recognized as the head of each of the smaller groups.

With their neighbors these people seem to have been on generally good terms. There appears to have been a strong bond between them and the Big Bend or Madesi group. With these there was frequent interchange of privileges, intermarriage, and mutual assistance in time of warfare.

This group probably included about 150 people.

MADESI

Probably the most densely populated area of the Pit river was that of the Made'si about Big Bend. It was the point of attack for the Yana and the Shasta, while the inhabitants seemed content to remain at home and enjoy their well endowed country. The valley center of this area is of limited extent and is set off by steep walls. Winter brings heavy snows to the high flat above the river; the valley has rain rather than snow. The heavy precipitation results in a dense and varied vegetational cover. With the pine and fir of the hills are the manzanita, dogwood, yew, ash, maple, and oak of the valley. What would have been a dense undergrowth was prevented by annual spring burnings following the retreating snow. A number of small ponds above the river furnished tule, grasses, and the roots characteristic of the swampy areas. In addition they offered a resting place for the myriads of waterfowl in the spring.

The banks of the river were carefully divided into plots, each of which had its characteristic name and was owned by one man. One such man might own a pond frequented by geese. He "owned" the geese, but permitted others to come and conduct a communal hunt. He was the director of the hunt and ostensibly owner of all the birds killed. Madesi, the whole Big Bend area, included at least twenty-one of these smaller units.

The Madesi had no sort of general chief. There were directors of the hunt, but their authority ended there. There were men who were stationed as watchmen against the enemy, and men who because of their ability led in battle. Some man might become influential through gaining the confidence of the people, but he was not a hereditary chief.

The Madesi had powerful enemies in the Yana and the Shasta; with the Wintun they were on the friendliest of terms. They seem never to have left their own valley, but rather to have been the objects of attack by others. As things went in the region, they were wealthy and so probably aroused the envy of their powerful neighbors. Against the Yana particularly they were no match.

Four hundred should be a conservative estimate of the former numbers of the Madesi.

THE ATSUGEWI

Atsuge'wi is the name generally applied in anthropologic literature to the groups locally known as Hat Creek and Dixie Valley Indians, as Hadi'twiwi and Ami'tsi to the Achomawi, and as Atsuge' and Aporige' to themselves.

ATSUGE

Upper Hat creek from a point about six miles below Cassel, and upper Burney valley, were the sites of the villages of the Atsuge' or Hat Creeks. They claimed the country to Lassen Peak and visited it in summer. Deep snows in winter forbade the permanent occupation of this back country. Hat Creek valley, several miles wide in its lower portion, narrows rapidly to the south and rises to the Lassen Peak knot. Its eastern side is a scarp wall in the dissected lava mesa; its western rests on the flank of Burney butte. Nowhere in the valley is the soil deep above the lava floor.

The mountain to the west and south is heavily covered with pine, fir, and cedar. The valley has something of a park landscape, with tule, willow, and alder along the stream bottom, and pine, oak, manzanita, and sage characterizing the valley floor. Formerly the streams contained an abundance of salmon, pike, trout, and suckers; the valley and hills abounded in large and small game, waterfowl, and upland birds.

The settlement sites were in the lower valley, the upper valley and mountains being visited only in summer. There were three main clusters of winter houses, with a fourth minor one at Burney. The upper one was about eleven miles above Cassel on Hat creek, where the valley narrows sharply. This was called Lumugi'tchi. About half the distance down stream toward Cassel was the second, Achipi'tsti. The third, Atspagi', was about the lake at the head of Rising river, directly east of Cassel. The fourth settlement cluster was on Burney creek near the present site of Burney and was called Neya'. From these sites the people ventured in summer to the region of Black butte as well as to Lassen Peak.

For each settlement there was a hereditary chief, but no general chief for the whole group. Hereditary ownership was recognized for the areas about the winter houses and also for oak groves and the like.

The Atsuge were frequently at odds with the Ilmawi and have traditions of former raids of the Klamath. With the Yana and Maidu they seem not to have come in conflict. The boundaries with these groups were natural and effective; this does not hold with the Ilmawi, and it was necessary to pass through the territory of the latter to obtain the all-important supply of obsidian from Glass mountain. Informal trade relations were maintained with the Aporige or Dixie Valley people and with the Achomawi of Goose valley and Big Bend, acorns being traded to the Aporige for furs, roots, and meat, these in turn being handed on westward for yew bows and disk shell money.

The four site clusters should have contained about 300 in former times.

APORIGE

The Aporige' occupied an extensive area from the Pit on the north to the Susan river on the south. It included Horse and Eagle lakes, though no settlements were maintained on the former. In addition there were a number of other sites, widely separated and difficult of access under modern conditions of travel. This is lava country, much faulted and broken. To the north, Horse creek runs by tortuous canyons from valley to valley; the lakes in the south are undrained depressions.

The vegetation cover reflects well the climatic régime. Slopes protected from the sun exhibit a heavy covering of pine; the open areas, juniper and sage; the valley floors, less timbered, formerly supported a heavy grass cover. Oak is present, but not in sufficient amount to have been of economic importance.

The valley floors are frequently marshy and support the general variety of roots, grasses, and tule. Game, large and small, was formerly abundant, upland birds are still plentiful, and waterfowl are said to have wintered in the ponds of the region, though this seems dubious in face of the severe winter cold. Salmon were lacking and fishing appears to have been of minor importance excepting possibly for the lake region of the south. The higher areas knew the elk and antelope and were visited in summer.

This is a country of heavy snows and winter cold, so that protected sites in the depressions were selected for settlement. The major locations were: Atsipasu'kati or Eagle lake; Apori'wa or Dixie

valley; Gudi'miwi or Little valley; Budsaluwu or Willow creek; and Kyupa'na or Grasshopper valley.

As might be expected from the isolation of the various sites, there was no central chief over the whole region; it is remarkable that the Aporige felt the degree of unity which they evidently did. There were chiefs of the local bands, and certain of these are said to have owned the adjacent hunting regions. Private ownership of fishing rights, ground hog holes, and eagle nests was respected.

The Aporige were on sufficiently good terms with most of their immediate neighbors to carry on a rather extensive interchange of commodities. From below Fall river they received salmon and disk beads; from Goose valley, yew bows; from the Atsuge, acorns. In return they gave roots, meat, hides, and furs. This barter was probably not carried on regularly, but came rather as the result of the visiting of relatives. The Aporige have the reputation of having been good providers.

With the Atsuge, Paiute, and lower Achomawi the Aporige were friendly. With the upper Achomawi, occasionally the Maidu, and frequently the Modoc, they were enemies. Because of the isolation of the Aporige and their unusual fighting prowess, the raids of the Modoc might seem fictitious, but there is clear evidence that they penetrated at least to the upper end of Dixie valley. A narrow deep canyon leads a distance of six miles from Coyote valley to Dixie valley. Near its upper course the canyon makes a sharp bend. A stone wall about two hundred feet long and three feet high leads from one side of the "U" to the other. Included within this are the remains of stone walls of perhaps a dozen houses. This was the summer retreat of the neighboring Aporige when raids were expected. The well preserved condition of the fortification leads one to suspect that it was constructed at least since the coming of the horse among the Modoc.

The numbers of the Aporige probably exceeded considerably those of the Atsuge. They themselves estimate a total of 1,000 for the whole Atsugewi group. An estimate of 400 for the Aporige leaves a shortage of 300 from their figure for the combined populations, but is probably nearer the truth.

SUMMARY

This, then, is the picture as it must have been: the whole region lent unity through its orientation about the Pit, through its general unity of climate and resource, and through its natural boundaries to north, south, east, and, in a measure, west. Within the region are a series of semi-isolated, habitable tracts. On the one hand, the unifying factors of a common culture, a largely common language, the strength of family ties, tended to encourage trade, exchange of food privileges, and mutual assistance against a common foe. To offset this, the strongly developed sense of belonging to a specific locality, in some cases reaching the proportions of definite land ownership, effectively prevented complete political unity. Even within the groups, political unity was generally circumstantial rather than natural.

During the long, severe winters the Indians crowded into their earth covered houses in the protected valleys. In the summer they ranged far and wide to the extent of their areas, gathering roots or berries, fishing, or making the long trek to the north for obsidian. A portion of their area they never reached because it offered them nothing that they could use.

The population was in the neighborhood of 3,000—roughly speaking three-fourths Achomawi and one-fourth Atsugewi.

Today the scene has changed. A comparatively sparse white population has occupied the same area. Where once roots were dug, hay is cut for the wintering of cattle; where salmon were speared stand great power dams; where stood earth houses are fields of grain.

The Indian has been pushed back to the undesirable rocky edges of the valleys or works as a laborer for the white rancher. But the children still speak the old language, the "doctor" or shaman is consulted rather than a physician, Christianity is unknown and undesired. The sense of belonging to or owning a particular site persists; they are Hat Creeks or Big Valley Indians first and then Pit Rivers.

ETHNOLOGY

The ethnological data collected are somewhat scattering for presentation in the present connection. Certain cultural traits, however, have a fairly coincident distribution, which can be conveniently shown in tabulation.

	Ham	Kos	Hew	Ast	Atw	Apo	Ats	Ach	Ilm	Its	Mad
Disposal of dead.....	c	c	c	c	c	b	b	c?	b	b	b
Private land ownership.....	o	o	o?	o?	o?	o?	o?	x	x	x	x
Hereditary chieftainship recognized by group.....	x?	x	?	x	o	o	(x)	o	o	o	o
Acorn complex.....	o	o	o	o	o	o	x	x	x	x	x
Canoes used.....	o	o	o?	o	o	o?	x	x	x	x?	x
Winter house pit shape.....	1	1	1	1?	1	1?	2	2	2	2?	2
Estimated population.....	250	125	175	200	300	400	300	350	350	150	400

x, present; *o*, absent; *c*, cremation; *b*, burial; *1*, rectangular (oval); *2*, round.

The four western Achomawi-speaking groups and the Atsuge buried their dead, built round winter houses, used dugout canoes on lakes and the still reaches of the river, possessed the full Californian acorn technique, owned food tracts privately or by families, but recognized no chieftainship over the group as a whole. The group areas were small and the population averaged 300. The five eastern groups and the Aporige usually cremated the dead, built their winter houses over rectangular or oval excavations, were without canoes or the acorn complex, and mostly recognized a group chief but no private ownership of food-bearing lands. The group areas were larger than in the west and the population smaller—averaging short of 250, or without the Aporige barely over 200.

The head of the salmon run in Pit river lay in territory of the Achomawi, the easternmost group of the western division. The effective limit of the oak is the Big Mountain range, at their eastern border. The area of the western division with its greater rainfall and milder temperatures was a more favorable site than the eastern. This is clearly reflected in the greater density of population.

Too great inferences are not justified from these data, but the correlation is rather striking, and it is a fact that some such line of division was recognized by the Indians.

It is worthy of note that the two Atsugewi-speaking groups belonged in culture respectively to the western and eastern divisions and not with each other.

APPENDIX 1.—PLACE NAMES

Atsugewi and Achomawi names for physiographic features of the region:

Bald Mountain	Ipa'koma Ats.
Beaver Creek	Bruse'wi Ats.
Black Butte	Eheomohodi' Ats.
Blue Mountain	So'lo'a'li' Ach.
Cedar Peak	Putehwa'ls Ach.
Centerville Peak	Upa'wa Ach.
Eagle Lake	Atsipasu'kati Ach.
Eagle Peak	Wadaksu'zy Ach.
Fall River	Su'kats Ach.
Fort Mountain	Si'mloke Ach.
Fredonyer Peak	Tehipa'eheo Ats.
Glass Mountain	Sa'ti't Ach.
Hayden Hill	Tsaha'matamatabo Ach.
Hayden Hill	Same'hewa Ats.
Horse Lake	Daskiakwu' Ats.
Kosk Creek	Anochi'chiwachi Ach.
Madeline Plains	Salu'twam Ach.
Medicine Lake	Sat Ach.
Lassen Peak	Bru'ikee'heo Ats.
Mt. Shasta	Yet Ach.
Mug Valley Hill	Andesuski'tsi Ats.
Nelson Creek	Alu'sazu'sa Ach.
Patterson Lake	Muchulycha'pti Ach.
Poison Lake	Ara'puma Ats.
Silver Lake	Solo'geheo Ats.
South Fork Mountain	Kopaa'ko Ach.
Sugar Hill	Tsikila'i Ach.
Upper South Fork Valley	Tulu'kupi Ach.
Warren Peak	Asala'dy Ach.

Names for neighboring groups:

Maidu	Pagmali' Ach.
Shasta	Sha'stichu Ach.
Wintun	A'kpimi or Apimi' Ach.
Yana	Ti'sache Ach.
White man	nila'ki (moves camp) Ach. wini'tsiki (come across) Ach.

APPENDIX 2.—NAMES OF SETTLEMENTS SHOWN ON MAP

Subgroups and village sites as shown on map 2. These are by no means all of the same rank and size. For instance, Buva of the Hammawi group contained several settlements of the rank of those listed for the Itsatawi.

Hamma'wi (Likely)

1. Tulu'kupi
2. Noknokchi'a
3. No name obtained
4. No name obtained
5. No name obtained
6. Bu'ya
7. Batsu'lomit
8. Lusate'mi
9. Suna'ucho

Kosale'ktawi (Alturas)

1. Kosale'kta
2. No name obtained
3. No name obtained

Hewise'dawi (Goose Lake)

1. Hatsina'i
2. Usi'na'dzi'wa
3. Ali'sede
4. Tsikila'i
5. Kue's

Astari'wawi (Hot Springs)

1. Dalmo'ma
2. Astari'wa
3. Tapaslu'
4. Ha'ntyu

Atwa'msini (Big Valley)

1. Asi'tiwa
2. Tsu'tsu'
3. Basi'wi
4. Tila'i
5. Nowi'stawadje
6. Nognogdz'ewa
7. Ga'sa'la'to'ma'
8. Atwa'm
9. Chahi'dje
10. Haweto'liwiis
11. Bahue'dje
12. Sustade'dje
13. Tsusa'dje

14. Uletsa'

15. Dilu'kasit
16. Dabo'ke
17. Lupua'mi
18. Lulupo'idse
19. Base'ma
20. Detu'lowadsi
21. Yape'do
22. Hastade'
23. Lawi'mewiis
24. Lowi'mawiis
25. Stawi'lidziis
26. Ta'wi'mzi'wi'is
27. Tsama'wimzi

Acho'ma'wi (Fall River)

1. Su'kama
2. Haolo'ma
3. La'su'sti'di'
4. So'ma
5. Zu'wawu
6. Ipu'lmi't
7. Ale'kupi
8. Su'lmaidsomi
9. O'litsimi
10. Yatsa'uki
11. Dasi'tski
12. Me'tma
13. Do'liwa
14. Suksuko'mits
15. Pi'tstom
16. Hatsu'it
17. Djasi'ti (Tule lake, about which were 9-13).

Ilma'wi

1. Suwi'tsiwa
2. Su'tti'te'okgeloi
3. Butlu'it
4. Ene'hiwawa
5. Tuwa'temi
6. Dataso'ba
7. Li'kik

- | | |
|---------------------------------|-------------------------------|
| 8. Buyalade' | <i>Made'si</i> (Big Bend) |
| 9. Sekoiyuwadi | 1. Lacha'sti |
| 10. Katsade' | 2. Kla'sika |
| 11. Dahanme'rtsa | 3. Alo'wachiwachi |
| 12. Ani'na-atwam | 4. Made's |
| 13. Oli'tme | 5. Tulipwade' |
| | 6. Djesima'de |
| <i>Itsa'tawi</i> (Goose Valley) | 7. Djedjepa'loi |
| 1. Ko'lituki | 8. Dimali'mehaboi |
| 2. Apa'ma | 9. Do'lmaahi'sti |
| 3. Kalali'si | 10. Basolo'ma |
| 4. Hotanahe'cha | 11. Sustada'me |
| 5. Kaskasadedjunkte'ma | |
| 6. Tapakanu'meha | <i>Atsuge'</i> (Hat Creek) |
| 7. Dinuwina'tehtahe | 1. Atspagi' |
| 8. Tzuwa'mki | 2. I'rdi'tsti |
| 9. Alu'wit | 3. Achipi'tsti |
| 10. Sanichaani'sti | 4. Lumugi'tehi |
| 11. Kopadu'lim | 5. Neya' |
| 12. Daho'wa | |
| 13. Tsa'salo'djuchi'chi' | <i>Aporige</i> (Dixie Valley) |
| 14. Skoi't | 1. Apori'wa |
| 15. Demyimo'woi | 2. Atsa' |
| 16. Tisi'tehawa' | 3. Kyupa'na |
| 17. Wida'wati | 4. Bu'dsa'lo'wu' |
| 18. Salikadu'mowoi | 5. Chu'knigi |
| 19. Doli't | 6. Gudi'miwi |
| 20. Bosa'kuma | 7. We'yukupi |
| 21. A'wama | 8. Warrazuri'ke' |
| 22. Widzu'wati | 9. No name obtained |
| 23. Tu'lipawiddjute'oki | 10. Wituwi'chi |
| 24. Sapti'ma | 11. Petskwa'mi |
| 25. Lume'totapōi | 12. Amo'dji |
| 26. Hema'lit | |

EXPLANATION OF PLATES

PLATE 55

Material Culture.

a. One of the stone house walls within the fortification erected by the Aporige against the Modoc raids on the canyon wall between Coyote and Dixie valleys about six miles east of Dixie. These were brush covered and used only in summer. The excellent state of preservation argues for comparatively recent use.

b. Pine dugout canoe about twenty feet long, typical of those used in Fall river area. Hollowed by burning and dressed with pumice. Used principally for fishing and ferrying. The site is on a stream tributary to Crater lake in the northern part of Fall River valley.

c. Paiute type of sweat house introduced in recent times among the Achomawi. The frame is blanket covered and steam is produced by pouring water on the hot stones. Near Crater lake in Fall River valley.

*a**b**c*

PLATE 56

Village Sites. Western Area.

a. Site of Katsade, Ilmawi village at the mouth of the canyon cut by the Pi in its course west from Fall River valley. The mountains transverse to the canyon form the boundary between the Ilmawi and Achomawi of Fall river. Now site of Pit 1 power house.

b. A round winter house hole about fifteen feet in diameter, on the site of Katsade or Pit 1. The trees in the middle ground are oak. The south-facing slope in the distance has a cover of sage and juniper, the result of added evaporation.

c. Site of the former Atsuge village of Achipitsti, near the east bank of Ha creek about six miles south of Cassel. Pine and some oak appear in the background.

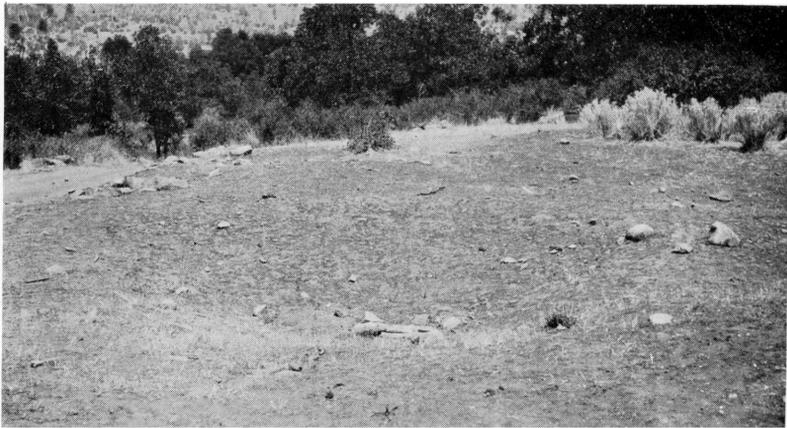
*a**b**c*

PLATE 57

Village Sites. Eastern Area.

a. Gudimiwi or Little valley on Horse creek about five miles above its mouth. One of the marshy valleys in the Aporige territory which offered a favorable location for settlement. The principal settlements were on the far side of the valley.

b. Looking north over the former site of Astariwa or Hot Springs. About four miles above Canby on the road to Alturas. The characteristic open formation of sage and juniper is well illustrated.

c. An unnamed village site of the Kosalektawi near the place where Rattlesnake creek breaks out of the lava mesa into the marshy valley of the Pit.

*a**b**c*

PLATE 58

Landscapes. Eastern Area.

a. Horse creek near the mouth of Bob's creek, showing the channels deeply incised in the lava mesa. The valley supports a heavy mixed forest. A region of little desirability, hence lacking in villages.

b. Looking northwest over Goose lake from the site of Tsikilai at the base of Sugar hill. The water level which formerly stood at the shore line in the middle foreground can be faintly distinguished in the far background.

c. Looking north on top of the mesa above the site shown in plate 3 *c.* It is the dry, fruitless, juniper and sage mesa so extensive in the Hewiseda area.

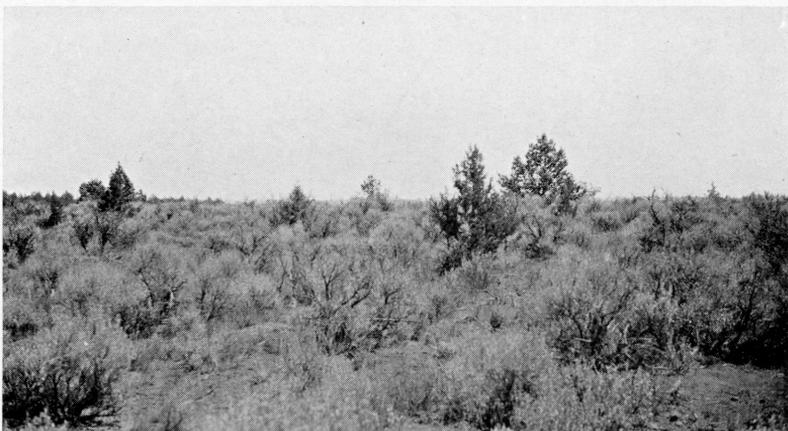
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PLATE 59

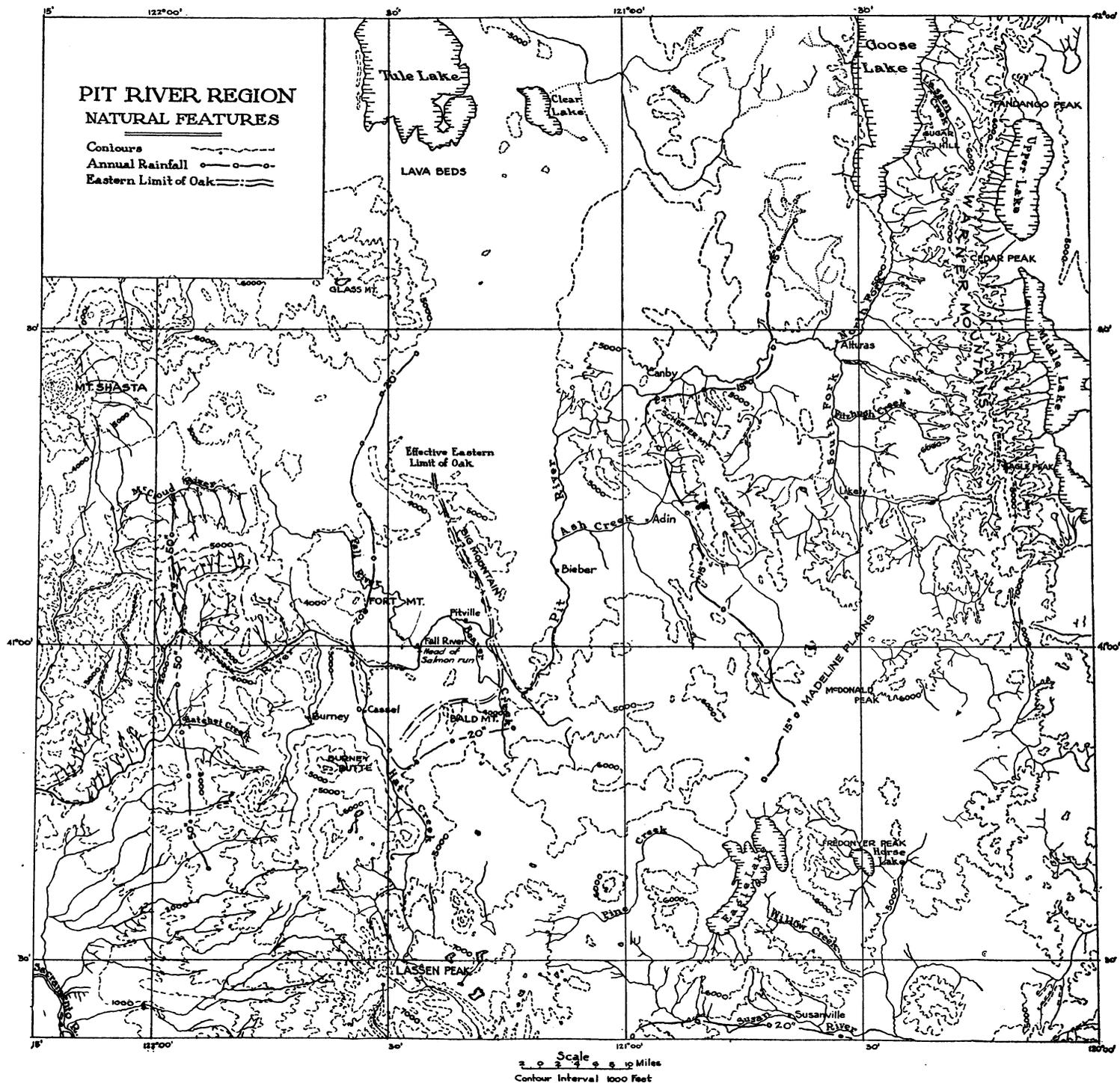
Landscapes. Western Area.

a. The high, flat, forested country between Hatchet creek and Big Bend. This formed the unoccupied zone between Yana and Achomawi. This region with its fifty inches of rainfall and heavy mixed forest contrasts strikingly with the country farther east with its twelve to fifteen inches of rainfall and typical juniper-sage association.

b. The Pit at Big Bend. Even in late summer the stream carries an immense volume of water. The vegetation is somewhat heavier than formerly when it was kept down by annual spring burnings following the retreating snow up the slopes. The site of Mades, the principal village of the Madesi, lay for a mile up and down stream on both sides.

c. Looking east at the scarp wall which formed the eastern boundary of the Ilmawi. This is at a point near Cayton valley several hundred feet above the Pit. In the foreground are pine and oak, on the exposed slopes juniper and sage.

*a**b**c*



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